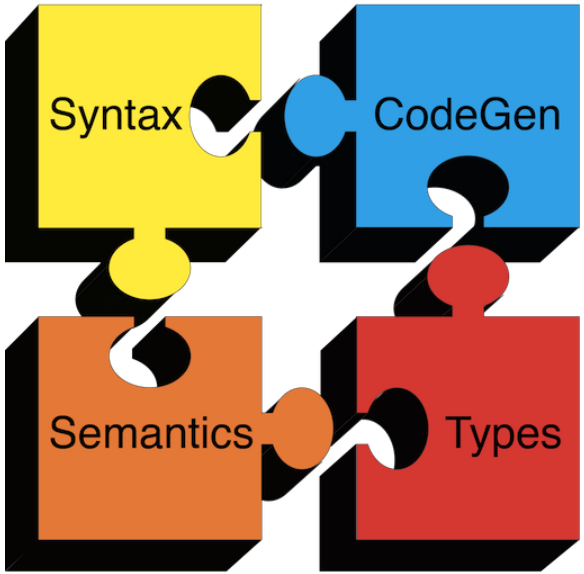
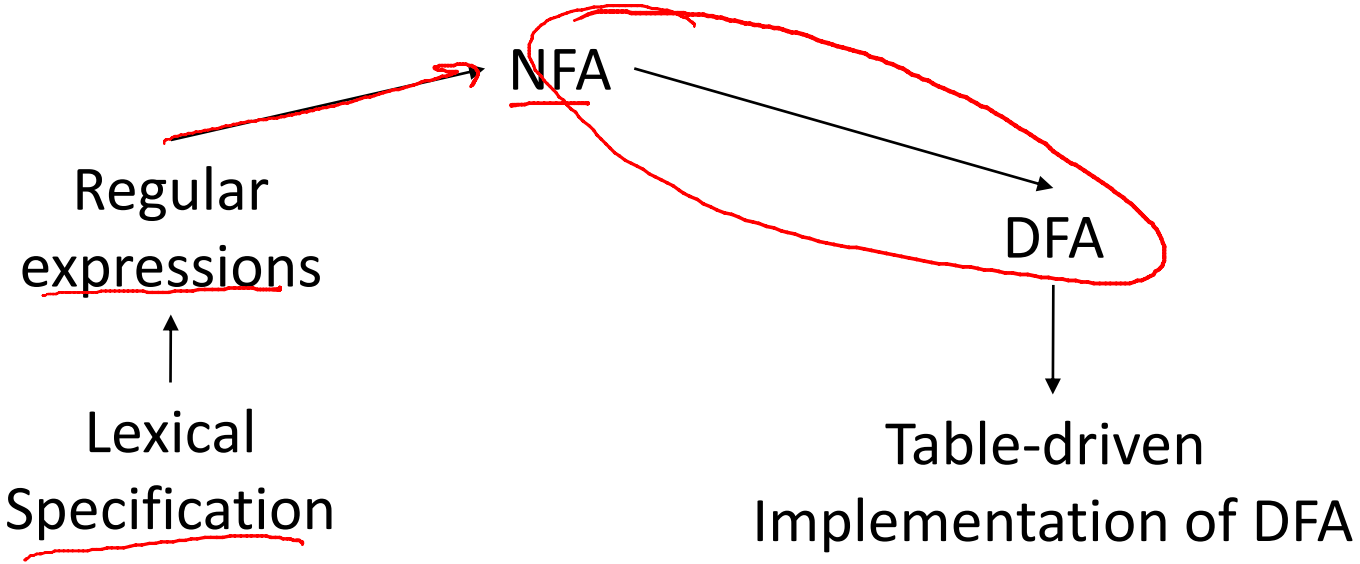


Compilers

NFA to DFA

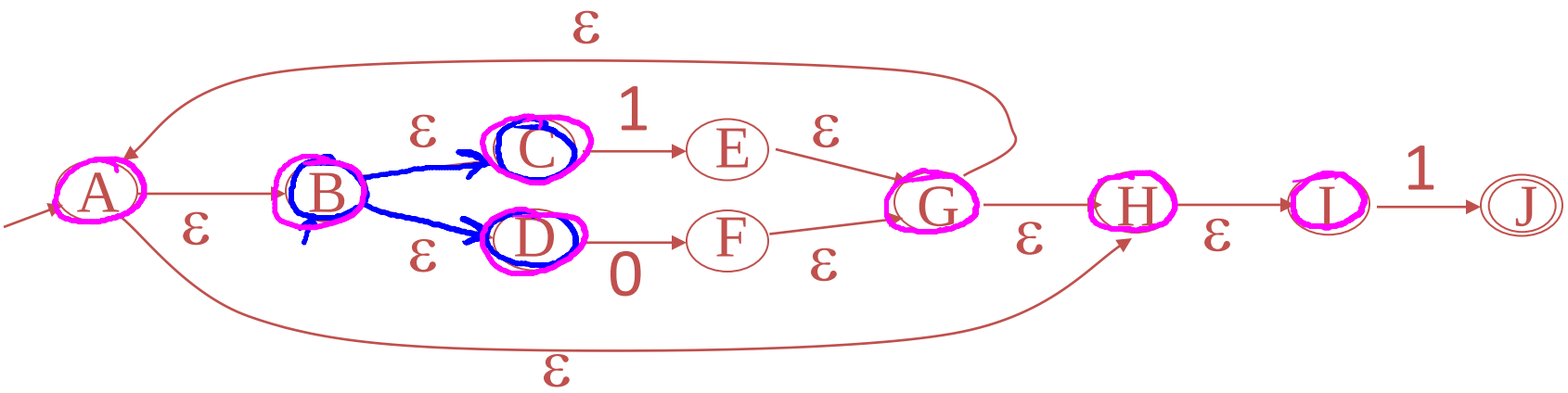
NFA to DFA


NFA
Regular expressions
DFA
Lexical Specification
Table-driven Implementation of DFA

NFA to DFA

ϵ-closure (B) = {B, C, D}

ϵ-closure (G) = {A, B, C, D, G, H, I}



NFA to DFA

- An NFA may be in many states at any time

- How many different states?

N states

$|S| \leq N$

$2^N - 1$ → finite set of possible configurations

NFA to DFA

NFA

states S

start $s \in S$

final $F \subseteq S$

$a(X) = \{ y \mid x \in X \wedge x \xrightarrow{a} y \}$

ϵ-clos

DFA

states subsets of S

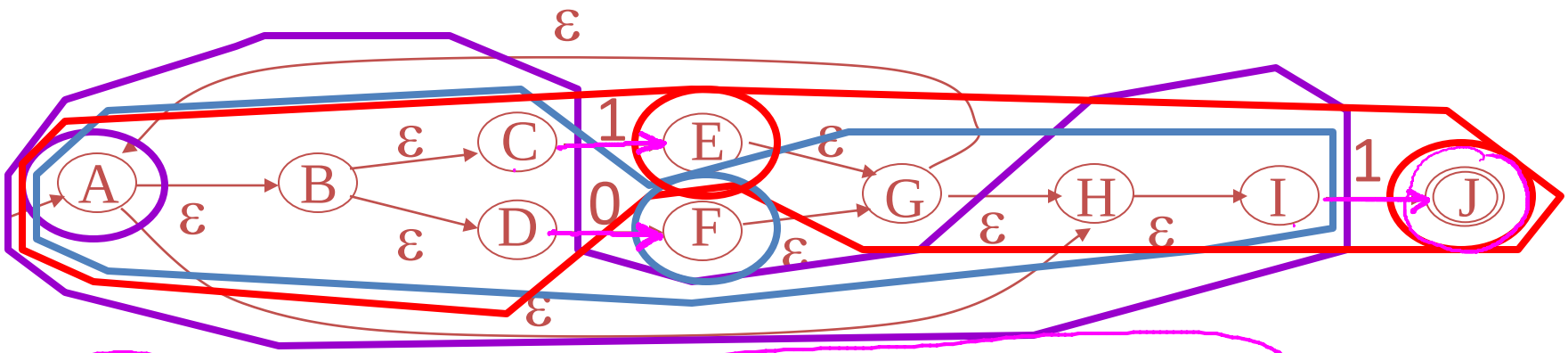
start ϵ-clos(s)

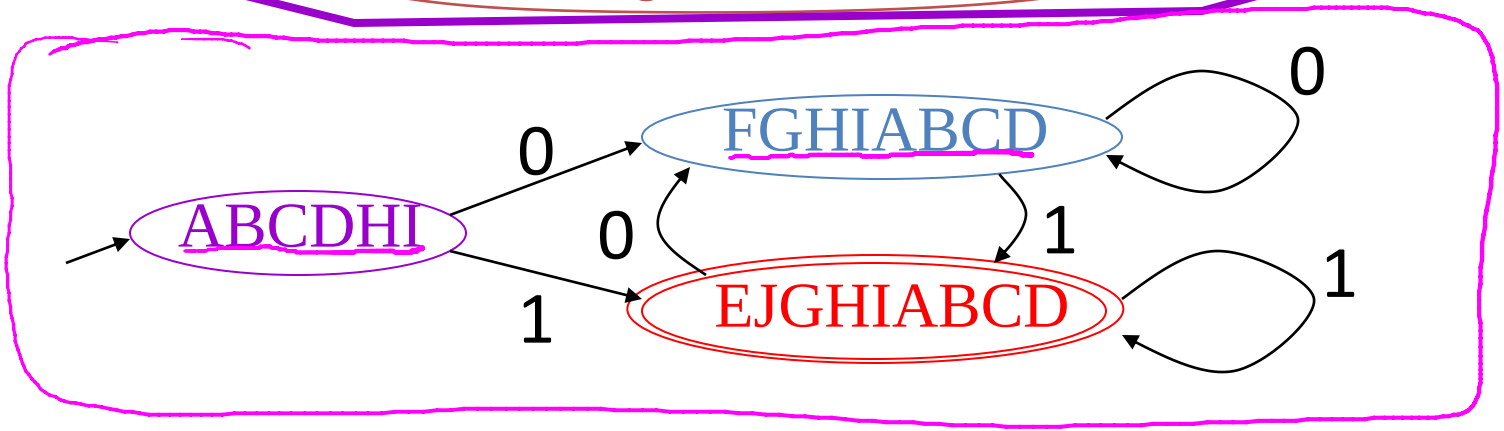
final $\{ X \mid X \cap F \neq \emptyset \}$

$X \xrightarrow{a} Y$ if

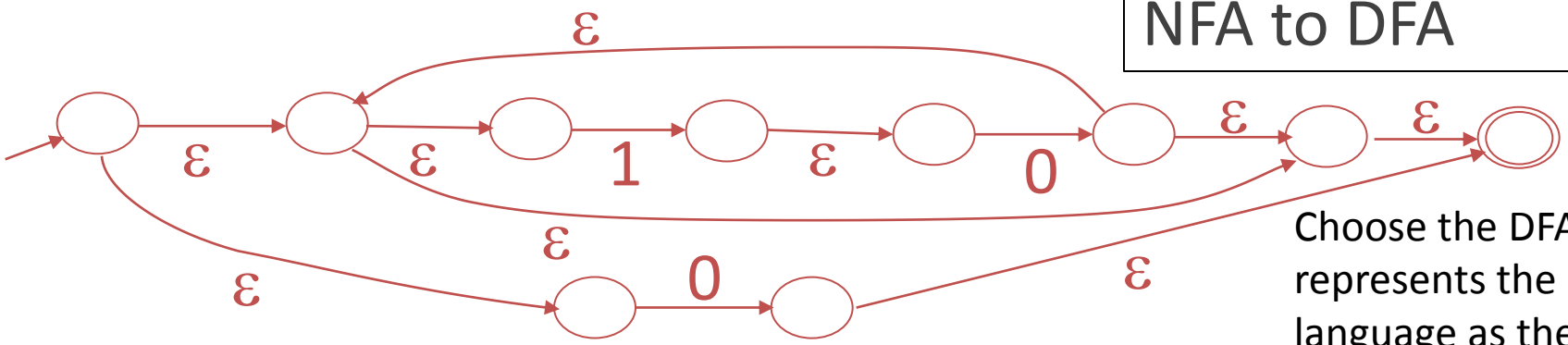
$Y = \epsilon\text{-clos}(a(X))$

NFA to DFA


ε
A
ε
B
ε
C
ε
D
1
E
0
F
ε
ε
G
ε
H
ε
I
1
J


ABCDHI
0
1
FGHIABCD
0
1
EJGHIABCD
0
1
1

NFA to DFA



Choose the DFA that represents the same language as the given NFA